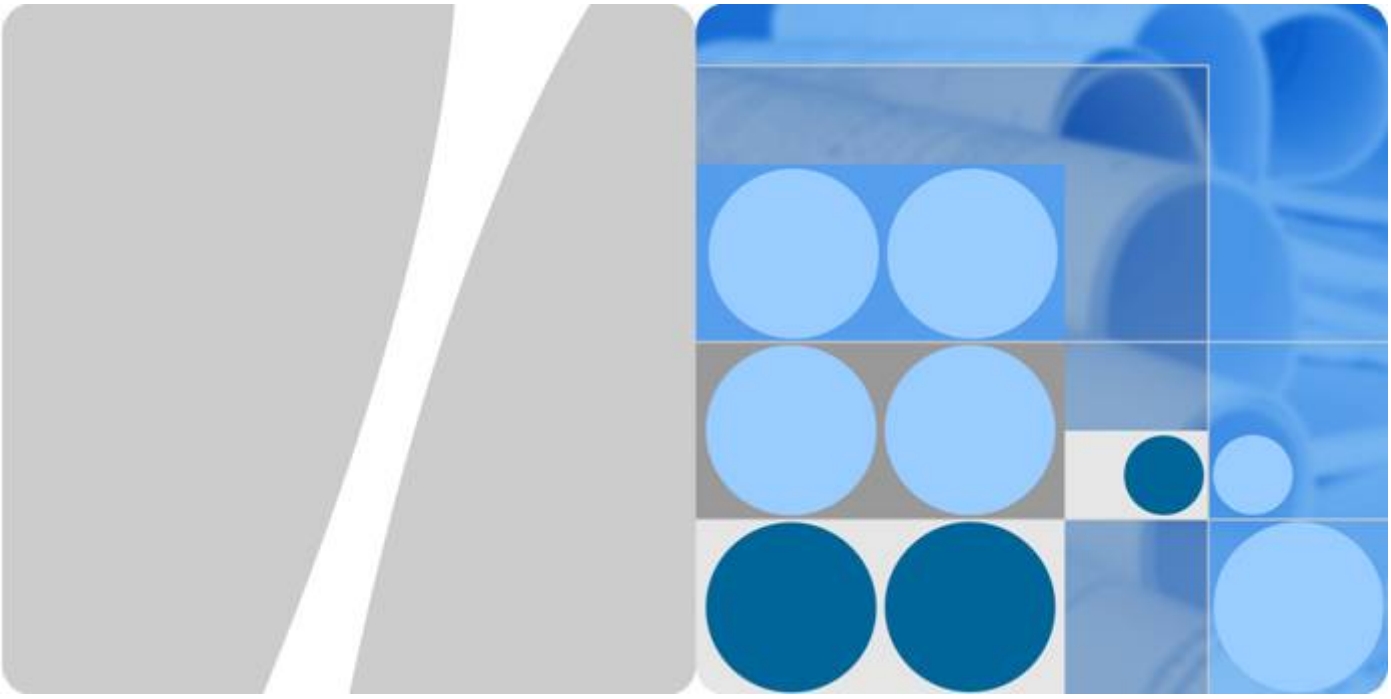

RRU3004

V301R008C00

Hardware Maintenance Guide

Issue 01

Date 2011-06-20

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About This Document

Purpose

This describes the RRU3004 routine maintenance. The routine maintenance consists of maintenance items, power-on and power-off operation, and procedures for replacing parts and modules.

Product Version

The following table lists the product version related to this document.

Product Name	Product Version
RRU3004	V301R008C00

Intended Audience

This document is intended for:

- System engineers
- Site maintainers

Organization

1 Changes in the RRU3004 Hardware Maintenance Guide

This describes the changes in the *RRU3004 Hardware Maintenance Guide*.

2 Maintenance Items of the RRU

This describes the maintenance items of the RRU. The maintenance items of the RRU involves checking the equipment surface, equipment cleanliness, and LEDs.

3 Powering On and Powering Off the RRU

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This describes how to power on and power off the RRU. When powering on the RRU, you should check the power supply voltage of the RRU and the status of the LEDs on the RRU. When powering off the RRU, you can perform normal power-off or emergency power-off operation based on field requirements.

4 Replacing the RRU

The RRU, a remote radio unit, forms a distributed BTS with the BBU.

5 Replacing the Optical Module

The optical module implements optical-electrical conversion, thus enabling optical transmission between the RRU and other devices. You need to remove the optical cable before replacing the optical module. Replacing the optical cable disrupts the transmission of CPRI signals.

Conventions

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
DANGER	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.
WARNING	Indicates a hazard with a medium or low level of risk, which if not avoided, could result in minor or moderate injury.
CAUTION	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
TIP	Indicates a tip that may help you solve a problem or save time.
NOTE	Provides additional information to emphasize or supplement important points of the main text.

General Conventions

The general conventions that may be found in this document are defined as follows.

Convention	Description
Times New Roman	Normal paragraphs are in Times New Roman.
Boldface	Names of files, directories, folders, and users are in **boldface**. For example, log in as user **root**.
Italic	Book titles are in *italics*.
`Courier New`	Examples of information displayed on the screen are in Courier New.

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Command Conventions

The command conventions that may be found in this document are defined as follows.

Convention	Description
Boldface	The keywords of a command line are in **boldface**.
Italic	Command arguments are in *italics*.
[ ]	Items (keywords or arguments) in brackets [ ] are optional.
{ x | y | ... }	Optional items are grouped in braces and separated by vertical bars. One item is selected.
[x | y | ...]	Optional items are grouped in brackets and separated by vertical bars. One item is selected or no item is selected.
{ x | y | ... }*	Optional items are grouped in braces and separated by vertical bars. A minimum of one item or a maximum of all items can be selected.
[x | y | ...]*	Optional items are grouped in brackets and separated by vertical bars. Several items or no item can be selected.

GUI Conventions

The GUI conventions that may be found in this document are defined as follows.

Convention	Description
Boldface	Buttons, menus, parameters, tabs, window, and dialog titles are in **boldface**. For example, click **OK**.
>	Multi-level menus are in **boldface** and separated by the ">" signs. For example, choose **File** > **Create** > **Folder**.

Keyboard Operations

The keyboard operations that may be found in this document are defined as follows.

Format	Description
Key	Press the key. For example, press **Enter** and press **Tab**.
Key 1+**Key 2**	Press the keys concurrently. For example, pressing **Ctrl**+**Alt**+**A** means the three keys should be pressed concurrently.
Key 1, **Key 2**	Press the keys in turn. For example, pressing **Alt**, **A** means the two keys should be pressed in turn.

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Mouse Operations

The mouse operations that may be found in this document are defined as follows.

Action	Description
Click	Select and release the primary mouse button without moving the pointer.
Double-click	Press the primary mouse button twice continuously and quickly without moving the pointer.
Drag	Press and hold the primary mouse button and move the pointer to a certain position.

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Contents

About This Document.....iii

1 Changes in the RRU3004 Hardware Maintenance Guide.....1-1

2 Maintenance Items of the RRU.....2-1

3 Powering On and Powering Off the RRU.....3-1

3.1 Powering On the RRU.....3-2

3.2 Powering Off the RRU.....3-2

4 Replacing the RRU.....4-1

5 Replacing the Optical Module.....5-1

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Figures

Figure 4-1 Loosening the captive screws on the main bracket..... 4-2
Figure 4-2 Tightening the screws on the attachment plate.....4-2
Figure 4-3 Hammering the RRU.....4-3

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Tables

Table 2-1 Maintenance items of the RRU.....2-1

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1 Changes in the RRU3004 Hardware Maintenance Guide

This describes the changes in the *RRU3004 Hardware Maintenance Guide*.

01 (2011-06-20)

This is the first commercial release.

Compared with issue draft A (2011-01-20) of V301R008C00, this issue does not include any new topics.

Compared with issue draft A (2011-01-20) of V301R008C00, this issue does not incorporate any changes.

Compared with issue draft A (2011-01-20) of V301R008C00, this issue does not exclude any topics.

Draft A(2011-01-20)

This is the draft A release.

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2 Maintenance Items of the RRU

This describes the maintenance items of the RRU. The maintenance items of the RRU involves checking the equipment surface, equipment cleanliness, and LEDs.

Table 2-1 describes the maintenance items of the RRU.

Table 2-1 Maintenance items of the RRU

Item	Frequency	Guidelines	Reference Standards
Checking the equipment surface	Every month or every quarter	Check whether there are dents, cracks, holes, or corrosion on the surface of the equipment and whether the label on each equipment is legible.	None
Checking the equipment cleanliness	Every month or every quarter	Check whether the equipment is clean.	The surface of the equipment is clean and no dust accumulates inside the cabinet.
Checking the LEDs	Every month or every quarter	Check whether the LEDs on the equipment work properly.	For detailed description of the LEDs, see RRU Indicators.

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3 Powering On and Powering Off the RRU

About This Chapter

This describes how to power on and power off the RRU. When powering on the RRU, you should check the power supply voltage of the RRU and the status of the LEDs on the RRU. When powering off the RRU, you can perform normal power-off or emergency power-off operation based on field requirements.

3.1 Powering On the RRU
This describes how to power on the RRU and check the RRU status. You should set the corresponding MCB on the auxiliary power device for the RRU to **ON** and then determine the operating status of the RRU based on the LED status.

3.2 Powering Off the RRU
This describes how to power off the RRU and check the RRU status. The RRU power-off is classified into normal power-off and emergency power-off.

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3.1 Powering On the RRU

This describes how to power on the RRU and check the RRU status. You should set the corresponding MCB on the auxiliary power device for the RRU to **ON** and then determine the operating status of the RRU based on the LED status.

Prerequisite

- The equipment and cables of the RRU are installed.
- The input voltage of the DC RRU is within the range of -36 V DC to -57 V DC.

Context

CAUTION

When the RRU is unpacked, it must be powered on within 24 hours. Each time the RRU is maintained after being put into formal operation, the power-off duration cannot exceed 24 hours.

Procedure

Step 1 Power on the RRU.

DANGER

Do not look into the optical module after the RRU is powered on.

Step 2 Wait 3 to 5 minutes, and then check the status of the LEDs on the RRU. For the meaning of the LED status, see RRU Indicators.

NOTE

If RRU modules are cascaded, check the status of the LEDs on each of the RRU modules.

Step 3 Take corresponding actions based on the LED status.

If...	Then...
The RRU runs properly	End the power-on task.
The RRU is faulty	Rectify the fault, and then go to **Step 1**.

----End

3.2 Powering Off the RRU

This describes how to power off the RRU and check the RRU status. The RRU power-off is classified into normal power-off and emergency power-off.

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Procedure

Step 1 Choose normal power-off or emergency power-off based on different situations.

If...	Then...
The RRU needs to be powered off in the case of an equipment swap or a foreseeable regional blackout	Go to **Step 2** to perform the normal power-off.
An emergency such as an electric spark, smoke, or water immersion occurs in the RRU	Go to **Step 3** to perform the emergency power-off.

Step 2 Set the corresponding MCB on the auxiliary power device for the RRU to **OFF**.

NOTE

If RRU modules are cascaded, take the impact on the lower-level RRU module into consideration when you power off an RRU module, so as to avoid disrupting ongoing services.

Step 3 Cut off the external input power of the auxiliary power device for the RRU. If time permits, set the corresponding MCB on the device to **OFF**.

----End

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4 Replacing the RRU

The RRU, a remote radio unit, forms a distributed BTS with the BBU.

Prerequisite

- The tools and materials, such as an ESD wrist strap, M4 screwdriver, M6 screwdriver, waterproof tape, and insulating tape are ready.
- The quantity of faulty RRUs are confirmed, and new RRUs are ready.

Procedure

Step 1 Power off the RRU. For details, see **3.2 Powering Off the RRU**.

Step 2 Wear an ESD wrist strap or a pair of ESD gloves.

WARNING

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 3 Loosen the six screws on the cover plate of the cabling cavity by using the M4 screwdriver, and then open the cabling cavity of the RRU.

Step 4 Record all the cable connections on the panel of the board to be replaced.

Step 5 Disconnect the cables from the ports in the cabling cavity and on the bottom panel.

Step 6 Loosen the captive screws on the two contact pieces of the main bracket by using the M4 screwdriver, as shown in **Figure 4-1**.

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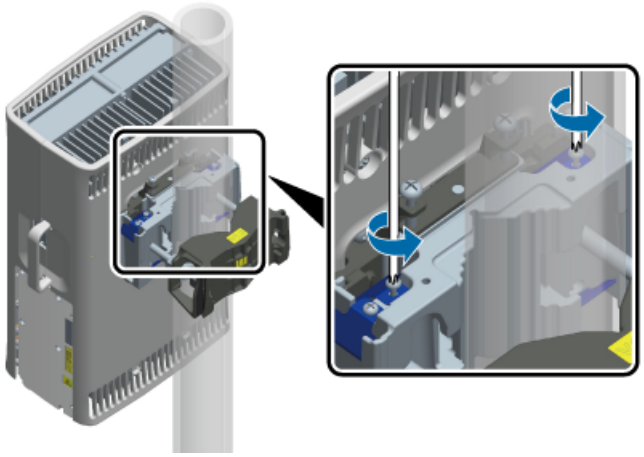
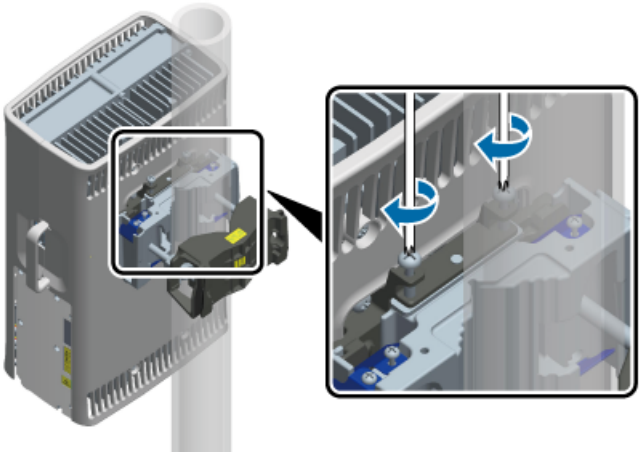
Figure 4-1 Loosening the captive screws on the main bracket



Step 7 Use an M6 screwdriver to tighten the screws on the adapting piece of the RRU, as shown in **Figure 4-2**. Lift the screws to loosen the connection between the adapting piece and the main bracket. Then, lift the RRU to uninstall it.

Figure 4-2 Tightening the screws on the attachment plate



WARNING

If the screws cannot be lifted, do not apply too much force. Instead, use a rubber mallet to hammer the RRU upwards to loosen the connection between the adapting piece and the main bracket, as shown in **Figure 4-3**.

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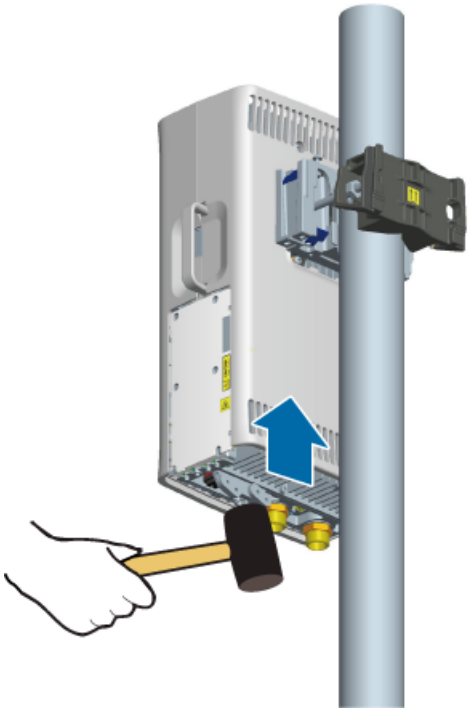
Figure 4-3 Hammering the RRU



Step 8 Tighten the captive screws on the two contact pieces of the main bracket until the tightening torque reaches 1.4 N·m. Install a new RRU, and then waterproof the RRU.

Step 9 Connect all cables to the RRU.

Step 10 Close the cover plate of the cabling cavity of the RRU, and then tighten the screws on the cover plate until the tightening torque reaches 1.4 N·m.

Step 11 Power on the RRU. For details, see **3.1 Powering On the RRU**.

Step 12 Check whether the new RRU is functional according to the status of the LEDs on the RRU. For details about the LEDs, see RRU Indicators.

Step 13 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced RRU into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new RRU.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

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5 Replacing the Optical Module

The optical module implements optical-electrical conversion, thus enabling optical transmission between the RRU and other devices. You need to remove the optical cable before replacing the optical module. Replacing the optical cable disrupts the transmission of CPRI signals.

Prerequisite

- The types and quantity of faulty optical modules are confirmed, and new optical modules are ready.
- The tools and materials, such as an ESD wrist strap or ESD gloves, ESD box or bag, and M4 screwdriver are ready.

Context

- The optical modules are installed on the CPRI_W and CPRI_E ports of the RRU.
- The optical module is hot-swappable.
- It takes about five minutes to replace the optical module of the RRU, which involves disconnecting the optical cables, removing the faulty optical module, inserting a new optical module, reconnecting the optical cables, and waiting for the CPRI links to resume.

Procedure

Step 1 Wear an ESD wrist strap or a pair of ESD gloves.

WARNING

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 2 Loosen the six screws on the cover plate of the cabling cavity by using the M4 screwdriver, and then open the cabling cavity of the RRU.

Step 3 Record the connections of the optical modules and optical cables.

Step 4 Press the latch on the optical cable connector, and then remove the connector from the faulty optical module.

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WARNING

Do not look into the optical fiber or optical module without eye protection after the optical fiber is removed from the optical module.

Step 5 Turn the puller of the optical module outwards, and then pull the puller until the optical module is removed from the RRU.

Step 6 Install the new optical module onto the RRU.

Step 7 Insert the optical connector into the new optical module.

Step 8 According to the status of the LEDs on the CPRI_W and CPRI_E ports, determine whether the CPRI links resume. For details about the LEDs, see RRU Indicators.

Step 9 Close the cover plate of the cabling cavity of the RRU, and then tighten the screws on the cover plate until the tightening torque reaches 1.4 N·m.

Step 10 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

After replacing the faulty optical module, check the following items:

- Place the replaced optical module into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new module.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty optical module.

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